

## **REMARKS**

Claims 1-6 and 30-45 remain in the present application. Claims 7-21 were previously cancelled and 22-29 previously withdrawn from consideration.

### **Claim rejections under 35 USC 112**

1) The Examiner rejected claims 1-6, 30-35, 37-38 and 40-45 under 35 USC 112, first paragraph. Specifically, the Examiner alleged that claims 1 and 40 recite a step, i.e., “selecting and appropriate solid substrate for facilitating attachment of the binding cavity on the solid support stamp to the solid substrate” which is not supported in the original specification. Applicant respectfully traverses.

According to the present invention, features of the method of producing the molecularly-imprinted chemical detection device are selected to produce a device which is advantageous over prior detection devices. The person skilled in the art, in view of the specification as a whole and common general knowledge, would readily be able to determine an appropriate solid substrate for facilitating attachment of the binding cavity on a solid support stamp. For example, and as outlined in the present application, thiol groups are particularly suited to form bonds to gold surfaces. The Examiner is directed to paragraph [0029] which states, in part: “the surface-attachable thiol groups act as cross-linkers between the binding cavity and the solid surface”. As pointed out in the previous paragraph, a gold surface is an example, cited in [0028], of a substrate that can be “selected to facilitate attachment”.

In one particular experiment, gold was selected as a substrate and monomers/polymers containing a thiol group -- this facilitated attachment to the solid substrate. As stated in the application and illustrated in the figures: “In one embodiment, the guest molecules are derivatized with thiol functional groups.” Applicant respectfully submits that the person of ordinary skill in the art would readily understand that gold is an exemplary substrate and would select it for use. In particular, it would have been well known in the art that gold is a particularly suitable metal substrate for surface plasmon resonance (SPR), which is exemplified in the present application (see paragraph [0028] *et seq.*). SPR is a known technique to detect the presence of attached compounds on a surface, and gold is often chosen as it is conducive to the attachment of specific functional groups, usually starting from thiol groups (i.e., the plasmon resonance occurs through the gold film). This is described in

paragraphs [0027] and [0028] and is one example within the context of the present invention of “selecting a substrate to facilitate attachment of the binding cavity.”

The application also states that: “the surface-attachable thiol groups act as cross-linkers between the binding cavity and the solid substrate”. Thus, it would be reasonably inferable from the specification as filed that said skilled person would be able to select an appropriate substrate.

Claims 2 and 37 were rejected because, according to the Examiner, “no recognition elements specifically formed of one monomer guest molecule are disclosed.” Applicant respectfully traverses.

The present application discusses both monomers and polymers which can be used to form a recognition element. The selection of the appropriate recognition element is tailored to the chemical to be detected. Applicant respectfully submits that the person of ordinary skill in the art would readily be able to determine appropriate recognition elements, whether as a monomer or polymer. The Examiner is directed to, for example, paragraph [0026]. The last sentence states: “In one embodiment, the guest molecules are derivatized with thiol functional groups”. The first sentence of [0026] describes a guest molecule as being “a derivatized functional monomer or polymer”. The skilled reader would understand that a thiol-derivatized monomer is one example of a derivatized monomer that can form a cavity without the need for polymerization. Thus, the skilled reader would readily understand that target molecules can be derivatized using at least one functional group.

Further, Applicant submits that the skilled person would understand that not all monomers may be polymerized, nor will a polymerization reaction “consume” all functional groups. This would be readily apparent at the experimental level. Certainly, some of the functional groups are freely available to serve as recognition elements. Limiting the claims solely to polymerization would unduly limit the scope of protection sought. Indeed, the term “monomer”, in the context of the present invention, does not necessarily mean that polymerization is essential.

In sum, Applicant respectfully submits that the claims are fully supported in the application as filed.

2) The Examiner rejected claims 1-6 and 30-45 as being unclear for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Specifically, the Examiner alleges that the claims are incomplete for omitting essential steps with respect to attaching the binding cavity and removing the molecular target bound solid support. Applicant respectfully traverses.

Step e) of claim 1 recites the attachment in the context of applying the stamp on the solid substrate, after having previously selected the substrate such that the attachment occurs (see Applicant's comments, above). Step f) recites the removal of the stamp from the substrate. Attachment and removal are a result of bringing surfaces in contact with each other, said surfaces having been selected such that the transfer of the molecular imprint from the stamp to the solid substrate occurs when the surfaces are brought in contact. Specifically, this will occur if the target is bound to the stamp (solid support) and the molecular imprint is bound to the solid substrate with greater strength than the bond between the target and the guest molecules. This condition can be intrinsic to the attachment, or it can depend on the conditions in which the removal is made, such as pH. The person of ordinary skill in the art would readily understand that attachment and removal are dependent on the substrate, guest molecule and the conditions used. Restricting the claims to any one set of conditions would unduly limit the scope of protection sought. The person of ordinary skill in the art, in consideration of the application as a whole and common general knowledge, would readily be guided to the appropriate conditions. Further, the Examiner is directed to one embodiment of the present invention, as described in paragraph [0035] *et seq.* There, it describes covalent bonds between the stamp and the target molecule and between the molecular imprint and the solid substrate, while the target-to-guest bonds are ionic.

The Examiner rejected claims 34 and 45 because they allegedly are omitting steps in the context of the attachment of two different binding cavities to the solid substrate into separate areas. Applicant respectfully traverses. Indeed, same or different molecularly imprinted polymers (MIPs) can be stamped at different locations on the solid substrate. The skilled reader, in consideration of the specification as a whole and common general knowledge, would readily understand that application of a further MIP can be achieved in accordance with method of the present invention. This can be done by repeating steps a) to f) of claim 1, but in different locations on the solid substrate. It would be unnecessary, confusing and unduly

limiting to recite a repetition of the steps, since the skilled reader would be able to determine the appropriate steps in the context of the present invention.

As for the Examiner's statement, in view of claims 33, 34, 44 and 45, that it is unclear what specific steps are required to ensure "special separation" between the areas, Applicant respectfully submits that there is no need for a "special separation" other than distance between the MIPs. Restricting the claims to a particular distance, or conditions for achieving said distance, would be unnecessary and would unduly limit the scope of protection sought. The skilled reader would readily be able to determine the appropriate distance, and conditions for achieving said distance, depending on the MIP selected.

The Examiner rejected claims 1 and 36 because, according to the Examiner, it is unclear whether or not the term "derivatized molecular target" necessarily means the target molecules ought to be derived from some unspecified primary target molecules. Applicant respectfully traverses. Indeed, the person of ordinary skill in the art would readily understand how the molecular targets are derivatized. Restricting the claims to a specific target would unduly limit the scope of protection sought. The skilled reader would be able to determine the appropriate derivatization in the context of the specification as a whole and common general knowledge. In accordance with one aspect of the present invention, the method teaches that the target is derivatized in order to be bound to the solid support, and that guest molecules are selected that can preferentially bind and form around functional sites in order to create a molecular imprint. Other characteristics of the target are dependent on the nature of the molecule used.

In sum, Applicant respectfully submits that the claims distinctly set out the subject matter of the invention.

It is submitted that this application is now in condition for allowance, and action to that end is respectfully requested.

The Applicant believes that no additional fee is due with this submission, but nevertheless authorizes the Commissioner to debit any required fee from or credit any overpayment to Deposit Account No. 501593, in the name of Borden Ladner Gervais LLP.

Respectfully submitted,

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